

President's Forum --- 27 Oct 2000

A Product that Went to the AF

~~SAB~~

Acquisition Agility

**The C2 Acquisition Process:
More Flexibility**

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PURPOSE OF THIS PRESENTATION

- ♦ **Make recommendations for changes which will enable the C2 Vision to be achieved in the near term to include**
Acquisition Agility
- ♦ requirements, as developed today, replaced by “concepts of operation” and “desired capabilities
- ♦ new funding approaches, particularly for the infrastructure, that enable more rapid fielding of capabilities
- ♦ process implementations in DOD Series 5000 that enable evolutionary acquisition using spiral development (EA/SD)
- ♦ centralized responsibility and management of the

Basic Assertion: Fundamental changes are required in the “acquisition” process

CONTEXT FOR THIS PRESENTATION

- ♦ **Since the C2 Summit in April 1997,** *Acquisition Agility*
the AF Vision for C2 has the basic characteristics that
 - ♦ **AF C2 must become web enabled (“ic2.com”)**
 - ♦ **AF Vision for Integrated Command and Control has two “architectural layers”**
 - ♦ **Mission and domain applications**
 - ♦ **Integrated IT infrastructure that services**
 - ♦ **Combat operations**
 - ♦ **Combat support**
 - ♦ **Business and functional operations**

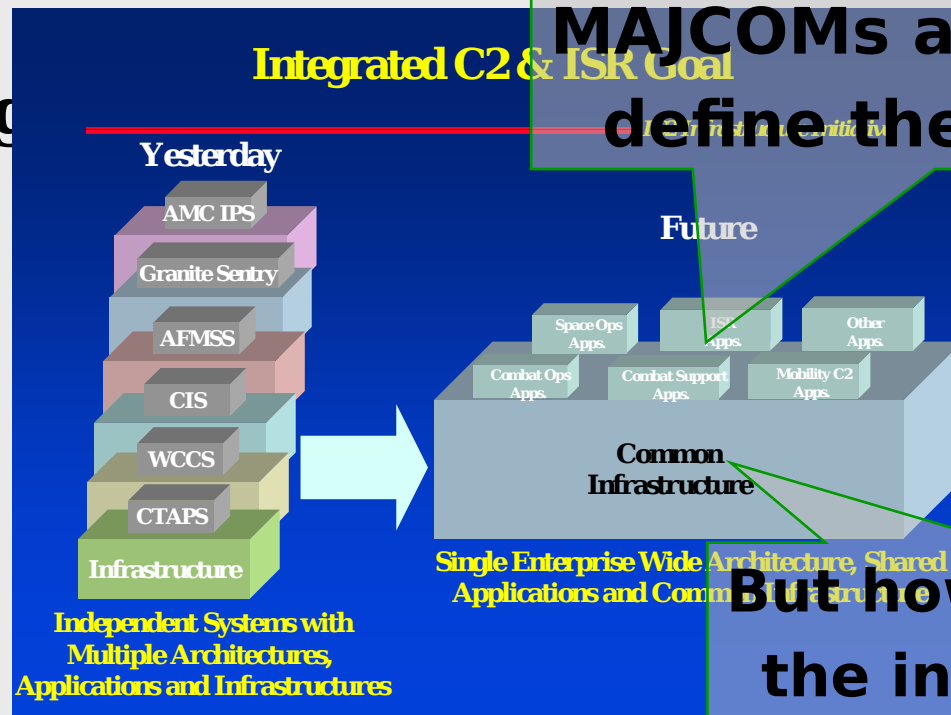
ny of the changes that are required apply to both layers. special attention is given to the infrastructure layer.

C2 VISION - OUTLINE OF THE IC2.COM

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The ic2.com will be web-like using the integration of commercial IT systems and DOD-developed systems, including systems

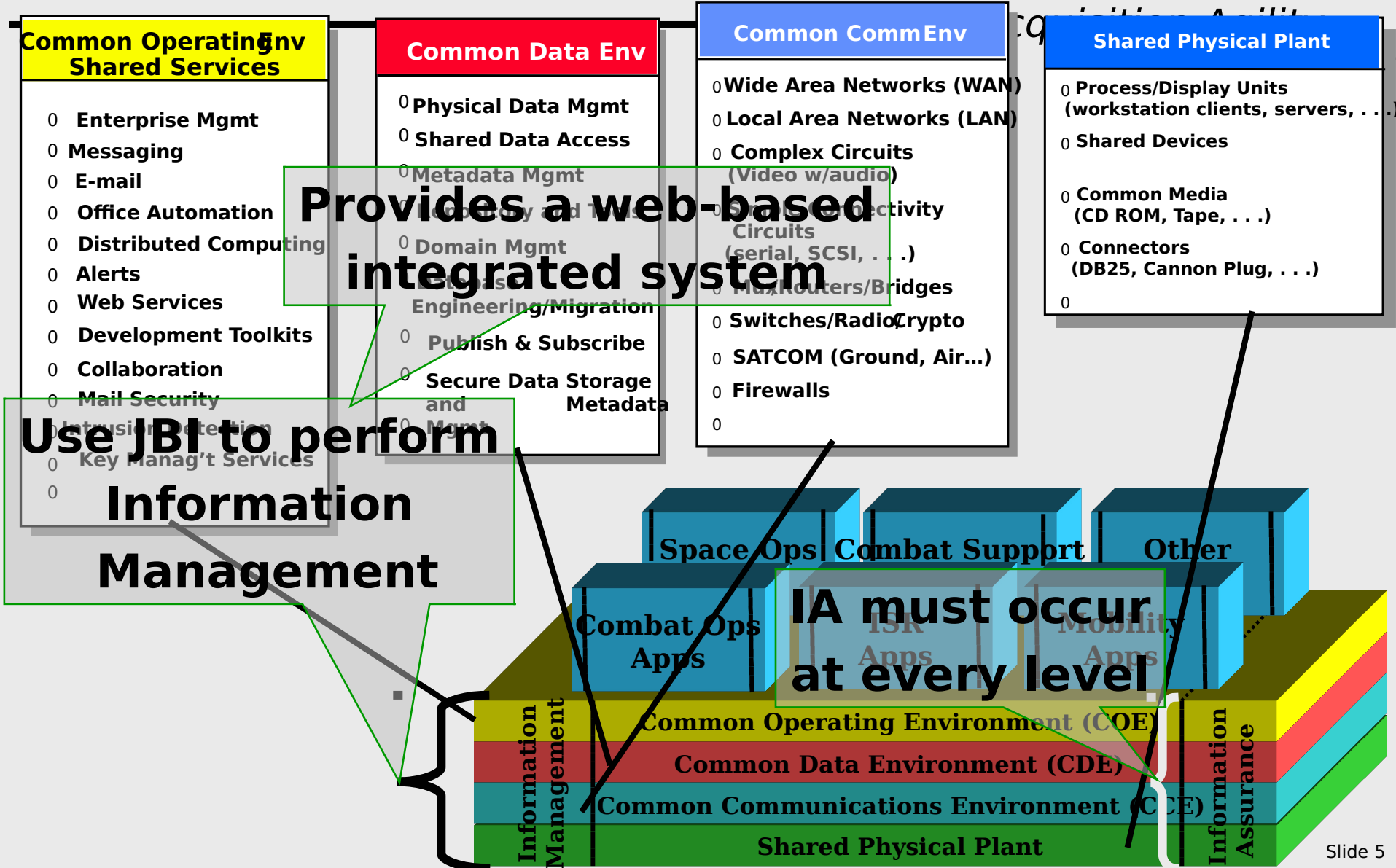
MAJCOMs and Functional
define the applications



But how do we build
the infrastructure?

Common Infrastructure Increases Integration and Affordability

Infrastructure (Component View)



HOW DOES THE AF VISION FOR INTEGRATED C2 RELATE TO GOOD PRACTICE IN COMMERCIAL INDUSTRY?

Some Case Studies

CISCO SYSTEMS, INC.

HBS 9-398-127, October 13, 1998

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- ♦ **Cisco has a centralized functional organization with three “lines of business”**
 - ♦ analogous to AF MAJCOMs
 - ♦ the business lines have no responsibility for several centralized functions, including IT, finance, and human resources
- ♦ **CIO, Peter Sorvik, proposed and built an “Enterprise Resource Planning System” for which he says:**
“**In a two year period (sic, \$100M), we literally replaced every piece of technology in the company. We have a very low-cost/high-value technology architecture. We have no mainframes, no mini computers, and no legacy technology. Everything is current.**”

CISCO SYSTEMS, INC. - 2

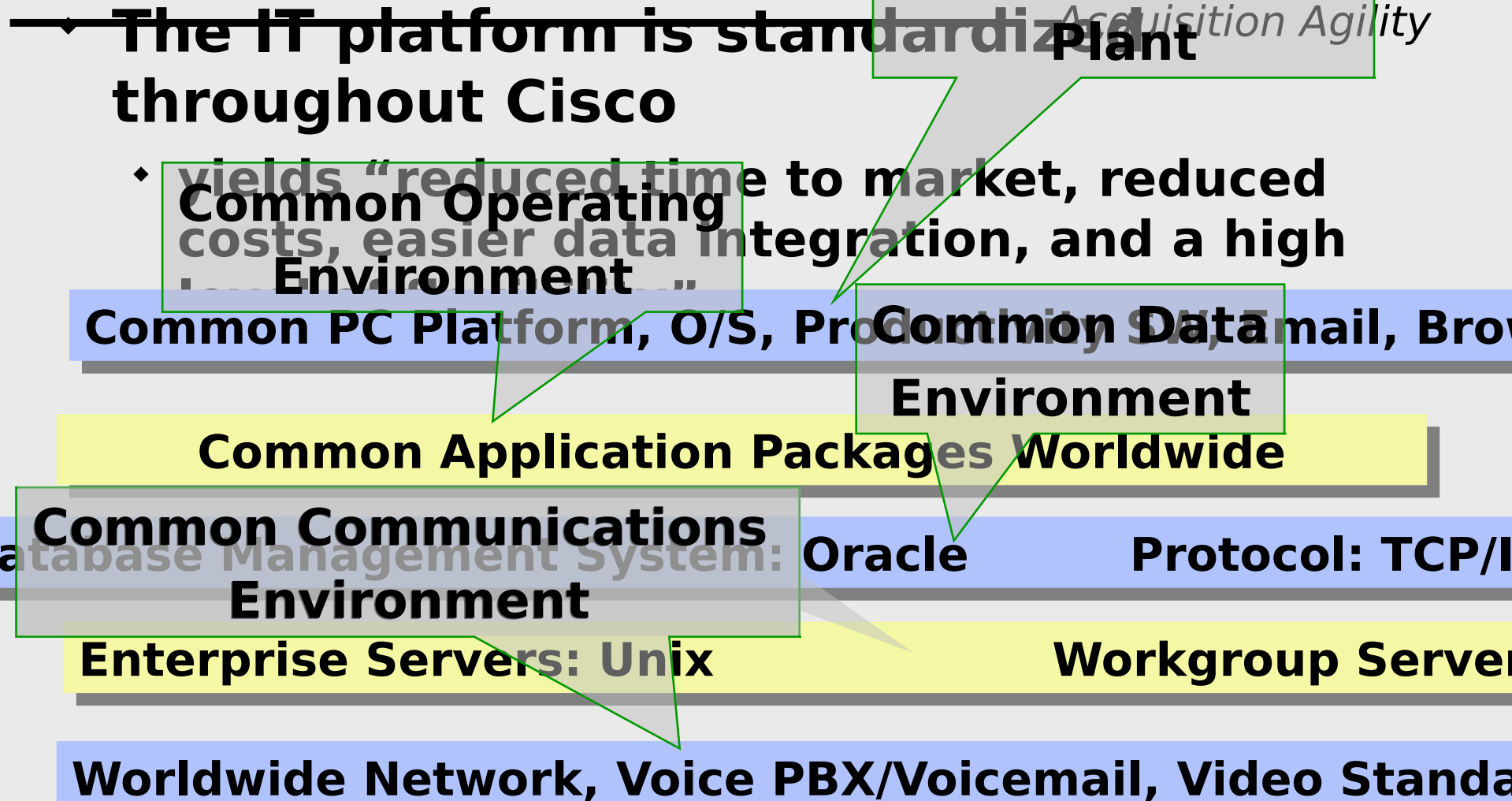


Exhibit 5: Cisco's IT Platform Architecture

CISCO SYSTEMS, INC. -3

♦ Web enabled using the Netscape browser *Acquisition Agility*

“When we purchased our applications, none were web enabled. We had to web enable them all. So we did that with a standard set of tools and a smart group of people.”

- ♦ **Cisco customer, partner and supplier interactions are network based**
 - ♦ begin at Cisco's Home Page
 - ♦ navigation done by “publish and subscribe”
- ♦ **Cisco has built its own global intranet**
 - ♦ allows global interaction within the company
 - ♦ provides a “proving ground” for new technologies and products
- ♦ **A Cisco study showed the centralized IT development saves as much or more than the actual costs (i.e., effectively the IT is “free”)**

OBSERVATIONS

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- **Cisco has implemented their decision support using a model very similar to the AF Vision**
- **Other companies, including Xerox, Sears, and Symantec have reached similar conclusions**

SUMMARY OF THE CASE STUDIES

Centralized
management

~~Each of these different infrastructure initiatives came to the conclusion that~~

- ♦ a centrally developed infrastructure, governed by a common architecture and industry standards, is necessary

Build the JBI

- ♦ the system is network-based and web-enabled
- ♦ information management is based on building common access to heterogeneous sources of data using a "publish and subscribe" model
- ♦ business units must use the infrastructure but develop their own applications as well as identify infrastructure deficiencies and provide

Conclusion: These represent general principles appropriate for use by the AF

Infrastructure will provide integration

Operators, supporters, functionals must address interoperability desires

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♦ **Provide Integrated and Interoperable Capabilities to the Warfighter**
Existence of infrastructure enables rapid fielding

Infrastructure rides the commercial marketplace

♦ **Reduce the Time to Field Capabilities**

♦ **Leverage the Burgeoning Technology Marketplace**

For this presentation, C2 encompasses all Information Management (IM) and Information Technology (IT) applications to include Combat Operations & Battle Management, Combat Support and business and administrative functions

Issues

Issue - Time to Market

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- ♦ **Current implementation of the acquisition process doesn't satisfy first order needs in any IT market environment**
 - ♦ **Process is cumbersome, bureaucratic and time consuming**
 - ♦ **Windows of opportunity are lost**
 - ♦ **Getting minor changes which have large impact are not capitalized on**
 - ♦ **Funding vehicles are not flexible**
 - ♦ **Regulatory constraints ties our hand**
 - ♦ **No effective method to accommodate technology insertion**

Without fixing these problems, AF C2 will not achieve the Vision summarized above.

Issue - Technology Leader

Acquisition Ability

- ♦ **Fast moving technology developments with commercial sector leading developments in IT**
 - ♦ **Everyone, friend and foe, has access to same technology**
 - ♦ **We need to keep up, as a minimum, with a strong desire to stay ahead**
 - ♦ **Our own technology will be used against us.**
 - ♦ **We need to be able to buy things as a pure “consumer” (I.e., whip-out our**

What will it take to purchase and apply the required commercial technologies quickly?

Issue - General

Acquisition Aaility

- ♦ **Current process lacks “trust”**
 - ♦ **Excessive coordination**
 - ♦ **Requirement statements too detailed**
 - ♦ **Program Element (PE) definitions are too narrowly defined - hard to move money in many cases**
- ♦ **Inflexible process**
 - ♦ **“One-size-fits-all” process not viable**
 - ♦ **Program Management Direction needs to enable integration**

How can the Air Force resolve these issues?

Issue - Infrastructure Requirements

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- ♦ **Currently, no organization has taken ownership of the infrastructure development**
 - ♦ **AC2ISRC, AFCIC, and AFMC/ESC all have some interest but none have been able to generate support**
 - ♦ **Infrastructure should be invisible to MAJCOMs and user/operators**
 - ♦ **Properly designed, the Global Grid and the Joint Battlespace Infosphere will provide the same benefits to AF and DOD as the companies in the studies achieved from their infrastructure developments**

The infrastructure is above all a technical development challenge and must support operational capabilities

A BASIC ASSERTION

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- ♦ **The Air Force process for defining, developing, acquiring, and fielding information systems, whether Command and Control, Combat Support, or business and administrative, is completely out of touch with the pace of the commercial Information Technology (IT) world.**

Fundamental changes are required in the “acquisition” process

Acquisition Process

**Starts with a Statement of
Operator Needs (or desires)**

What is a Requirement?

Note the initial emphasis on

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- ♦ **CJCSI 3170-01 “broad operational capability”**

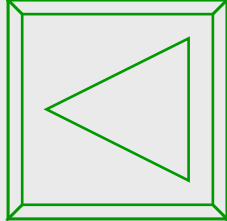
- ♦ The need of an operational user, initially expressed in broad operational capability terms in the format of a MNS. It progressively evolves to system-specific performance requirements in the ORD

- ♦ **AFI 10-601**

- ♦ A recommended solution to a mission deficiency that when validated and approved, justifies the timely allocation of resources to achieve capability to accomplish military objectives, missions, or tasks.

Note the emphasis on
“recommended solution”

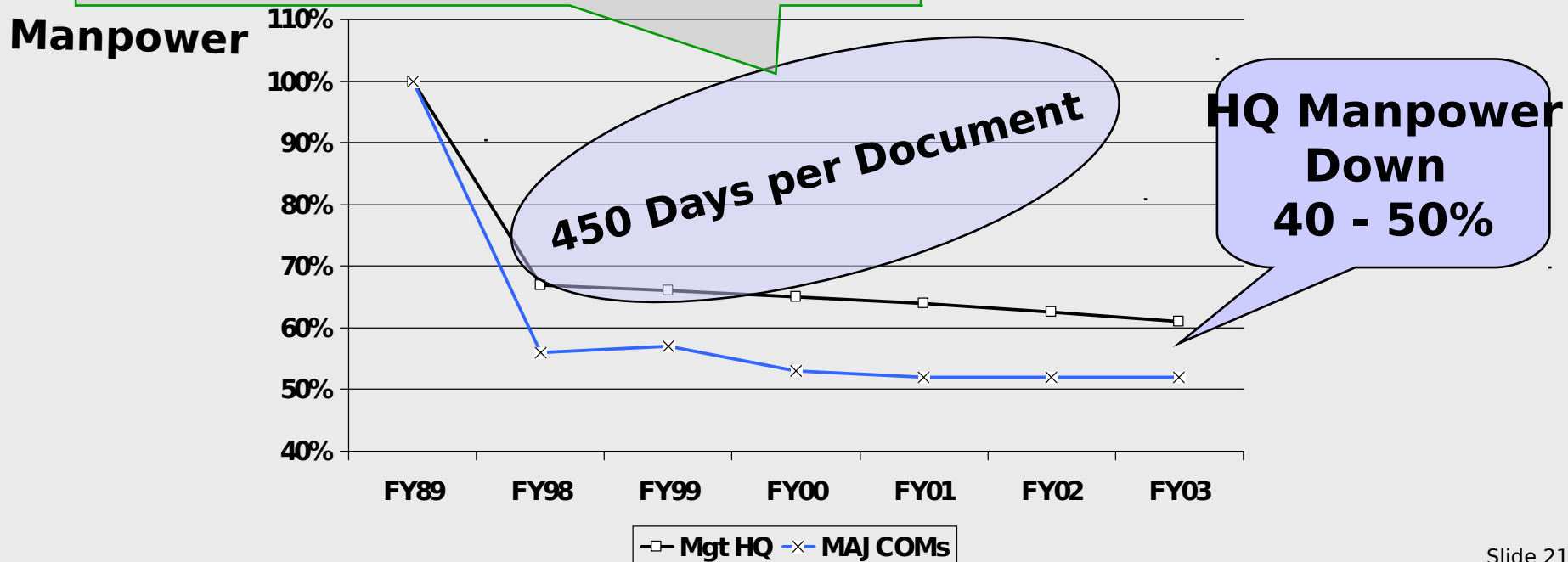
Why Change?



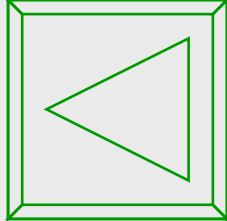
Information

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- Requirements Process Designed for Different experience one or two (or more) generations of change in this period
- World Environment has Changed
- Process timelines not well aligned with pace of technological change



The Current Process



No part of this process is

compatible with the pace of technology or the experience of

internal IM/IT development in commercial companies

Acquisition Agility

DoD 5000.2R
CICSI 3170.01
AFPD 10-6
AFI 10-601

FAR/DFAR
DoD 5000.1
DoD 5000.2

100 Docs/yr
1000+ People

Requirements Process
(MNS, ORD, CRD)

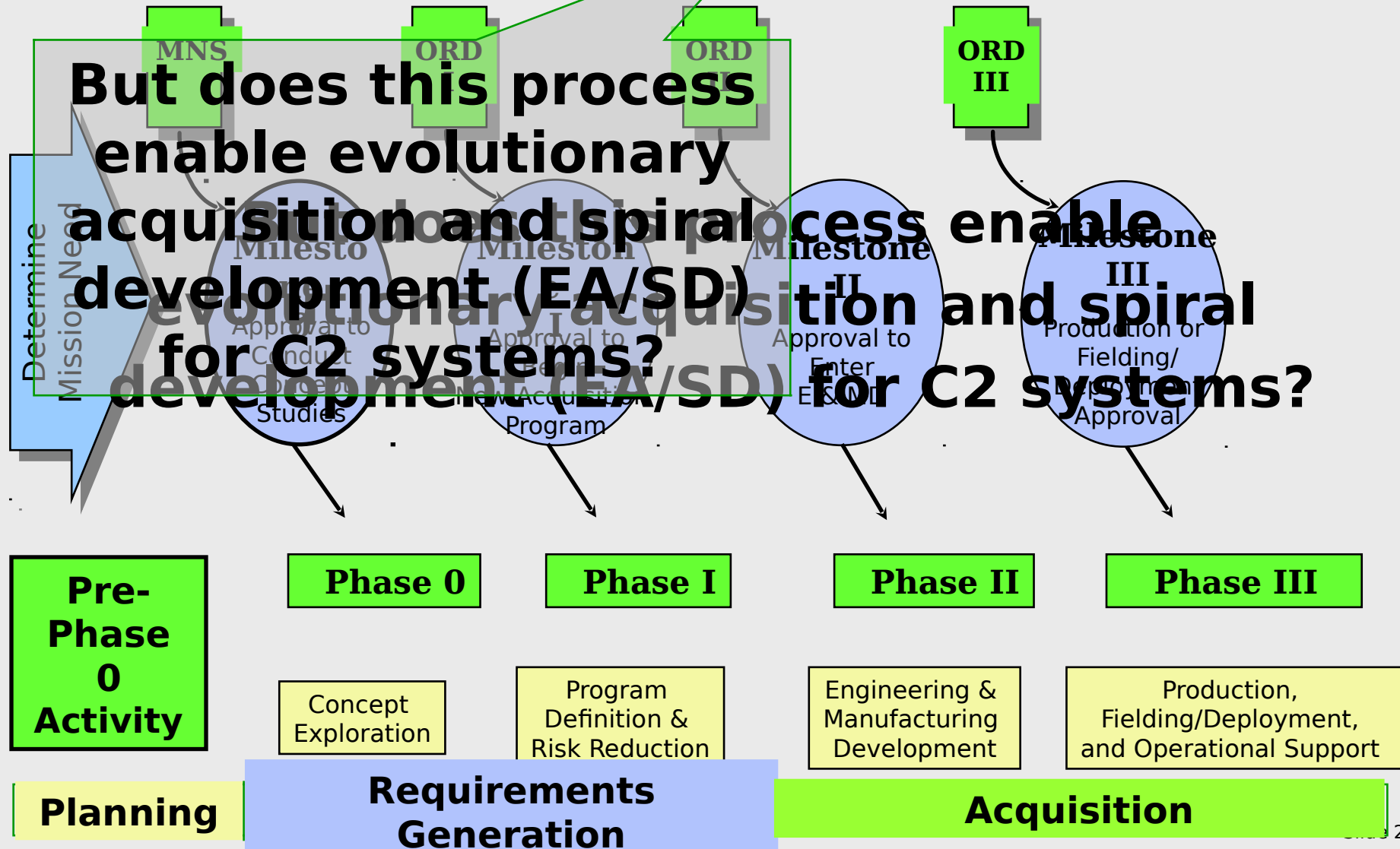
Acquisition Process
10+ yrs

1.5 yrs

Programming & Budgeting Processes 2yrs

Milestones & Phases: The 5000 Process

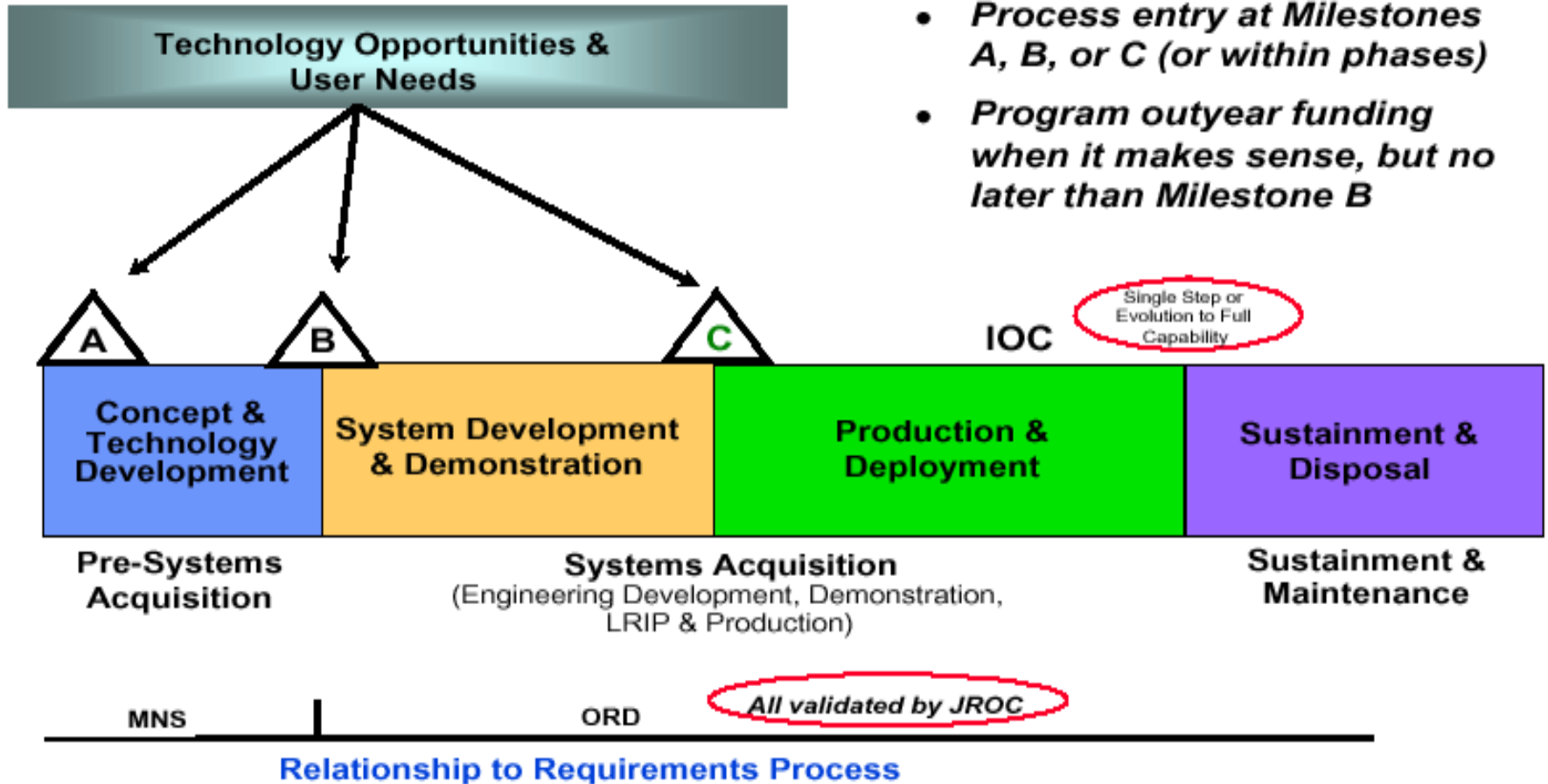
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Process in “New” 5000.1 Instruction

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- *Process entry at Milestones A, B, or C (or within phases)*
- *Program outyear funding when it makes sense, but no later than Milestone B*



But what conclusions follow?

Are there any Barriers to EA/SD?

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- ♦ **No barriers in the words of 5000 that prevent spiral or Evolutionary acquisition**
 - ♦ Encourages all desired characteristics of spiral
- ♦ **But emphasis in words, not in process**
- ♦ **Need to determine when approval is needed for requirements changes**
 - ♦ Depends on level of detail in ORD
 - ♦ Presently, ORD approval time is long,

process still seems serial and hardware oriented! Can the AF implement a process that satisfies the words but enables the spiral process?

To Realize the “Goals for AF C2”

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- ♦ **To achieve their version of the same goals, the experience of private corporations shows the need for the creation of a centrally-managed IM/IT infrastructure**

What can be done to mitigate the issues that hinder the AF and DOD in creating a commercial-like solution?

RECOMMENDATIONS

RECOMMENDATION - 1

Acquisition Agility

- ♦ To realize the AF Vision of integrated C2, requirements definition needs to be changed dramatically
 - ♦ the C2 concept of operations, mapped into desired operational capabilities, should drive C2 development

The desired capabilities are referred to as “desirements” (emphasizes the change from the term “requirements”)

- ♦ Desirements need to be developed through direct interactions of “operators” and “acquirers”
- ♦ The desirements must define the capabilities but CANNOT define how the capability is obtained (what not how!)

Generally, it is expected that desirements will change infrequently

RECOMMENDATION - 2

- ♦ **Program Elements need to be redefined more broadly, preferably in terms of the desired capabilities (i.e., desirements)**
 - ♦ **PEs should be defined in two general classes**
 - ♦ **operational/functional capabilities**
 - ♦ **infrastructure capabilities**
 - ♦ **Capability-based PEs should add flexibility to the manner in which appropriated funds are spent**
- ♦ **There needs to a C2 Capstone Program Management Direction (CPMD) document and**
 - ♦ **PMDs for each PE should support CPMD and should enable PMs to expend funds in a manner best suited to achieve the**

These steps should provide PMs with greater flexibility in responding to changes in operator emphases

implemented, this recommendation should free C2 development from many of the restrictions

Infrastructure

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- ♦ In accordance with Clinger-Cohen Act, the CIO is a reasonable choice
- ♦ The C2IO should establish policies and standards directed to the MAJCOM and functional organizations
 - ♦ to empower necessary business process changes
 - ♦ to ensure integration of new system developments
- ♦ The creation of the C2 infrastructure should be distinguished from the R&D process and regarded as a AF “business need”
 - ♦ 3080 or 3400 money seems more compatible with the need to rapidly evolve the infrastructure rapidly
- ♦ Invest initially in the infrastructure based on the industry experience.
- ♦ Responsibility for executing the creation and evolution of the C2 infrastructure under the CIO

Building the infrastructure will ONLY involve “developed” infrastructure capabilities

RECOMMENDATION - 4

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- ♦ **For the creation of operational and/or functional C2 capabilities, whether using the DOD Series 5000 process or “homegrown”, the AF must require that**
 - ♦ **all fielded developments will satisfy the infrastructure policies and standards**

platforms, airborne or spaceborne, as well as ISR systems of all types, need to be compatible with the infrastructure in order to make their data/information widely available

RECOMMENDATION - 5

- ♦ ~~Replace the “Predictive Banking” process of the PPBS system for developments that are based primarily on commercial IT capabilities, including enhancements to the infrastructure~~
- ♦ The use of desirements/desired capabilities should provide more flexibility in the application of funds

These last two items provide a mechanism for “non-predictive (or compatible “flexible predictive) banking” with the need to rapidly evolve, modernize, and sustain the infrastructure and IT-rich applications

- ♦ Create a “discovery” pot of money (I.e., a PE with no product focus but safeguards for Congressional oversight) to accommodate and include the successful IT products from experimentation or any other source
- ♦ Create “credit cards” to fund IT projects by business area, including the infrastructure, to enable the timely investment of new IT capabilities
- ♦ Must ensure that this satisfies requirements of

RECOMMENDATION - 6

Acquisition Agility

- ♦ **Implement the DOD Series 5000 for IT-intensive C2 systems using the spiral process that**
 - ♦ Indicates need for iteration to maintain flexibility
 - ♦ Recognizes sustainment of evolving and legacy systems is input to the next iteration
 - ♦ Encourages flexibility in requirements throughout the life cycle
- ♦ **Specify ORD at high enough level (create desirements) so changes and approvals are not required before every EA block begins**
 - ♦ Avoid specifying design in ORD
- ♦ **Experimentation, concept and technology development should occur continuously and in parallel throughout life cycle of the**

The C2IO must work proactively with DOD to ensure that DOD Series 5000 meets the needs of the AF

RECOMMENDATION - 7

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Specific Actions (I.e., infrastructure desirements) that
Common Data immediately to begin to build the infrastru

Environment short-term progress toward the
Global Grid and the JBI

1. Require ALL systems and data bases to
identify the information they provide and
build the XML representations
Common Communications

2. Require ALL communication systems to
Web-enabled interface that enables the use of
and “first-order” IP standards
Environment

3. Require ALL decision and information-
integration” providing elements to be addressable
using internet addressing standards (I.e.,
define AF C2 URLs)

4. Require ALL systems accessed for C2
purposes to have a “browser” interface

- ♦ **The C2IO should task ESC, immediately,**
to build the roadmap for achieving this
first instantiation of the integrated